14/3/22

pde 12 of the form

i dentically zero.

Assume that the solution of the given

Veriable Seperable Method

ucx, y) = xcx). ycx), neiner of

the fodors XCN) and 4CX) being

Solve these XCR) and 4CF) to find the Solution of the given pade.

Re Solve 
$$3\frac{\partial u}{\partial x} - 4\frac{\partial u}{\partial t} = 0$$
.  $-(1)$ 

$$u(0, t) = 5e^{-t}$$

$$u(x, t) = x(x) \cdot T(t) - (5)$$

34 = x'(x). T(t)

$$\frac{\partial u}{\partial t} = \chi(u) \cdot T'(t)$$

$$\frac{\int u \cdot \chi(u)}{\int x(u)} = \chi$$

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$$3 \times T - A \times T' = 0$$

$$3 \times T = A \times T'$$

$$\frac{1}{4} \times \frac{1}{4} = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{4} \times \frac{1}{4} \times \frac{1}{4} = \frac{1}{4$$

$$\Rightarrow \frac{T'}{37} = K$$

$$= \frac{T'}{37} = K$$

$$= \frac{1}{37} = \frac{1}$$

1st order

o DE.

$$\Rightarrow \frac{\lambda}{4} = \frac{37}{7}$$

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x' -4 KX = 0

m-45 50

m = 4 K

(4)

Moco

AE m-3 K ==

: T(6) = Be

m=3 K



3Kt

Now, 2 => u(x,+): Ae . Be

4KY 3Kt

u(x,t) = ce K[4x+8t]



2) Solve: 
$$2\frac{\partial u}{\partial x} + t\frac{\partial u}{\partial t} = 0$$
,  $u(x,i) = \frac{1}{3}e^{x}$ 

$$\frac{3e^{-1}}{2e^{-1}}$$

Cet 
$$u(x,t) = X(x) \cdot T(t) - 3$$

$$\frac{\partial u}{\partial x} = X'T$$

$$\frac{\partial u}{\partial t} = XT'$$

$$\frac{K'}{K} = -\frac{LT'}{2T} = K$$

$$\frac{-tT'}{2T} = K$$



$$\therefore X(x) = Ae^{Kx} - \boxed{3}$$

$$\begin{array}{c} (4) = ) \\ t + 2k + 2k \\ (4) = 0 \end{array}$$

$$\begin{array}{c} (4) = 0 \\ (4) = 0 \\ (4) = 0 \end{array}$$

$$cf: Be$$

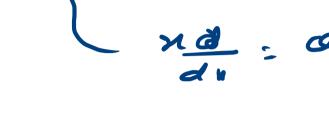
$$= Be^{-2k907t}$$

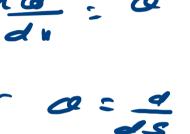
$$= Be^{-2k907t}$$

$$= Se$$

$$= Se$$

$$= Se$$





$$TG(t) = B(t^{2n})^{-1} \qquad G(t) = \frac{B}{t^{2n}}$$

$$(D =)$$

$$(CX,E) = Aa^{KX} \cdot B + E$$

$$UCX,E) = Aa$$

$$C = \frac{1}{3}$$

$$K = -1$$

$$X = \frac{1}{3}$$

$$: u(x,t) = \frac{1}{3}e^{x} \cdot \frac{1}{E^{2}} = \frac{1}{3}e^{x}$$

Given: Uloit) = 5 e-t

Company both sides.

$$C=5, \qquad 3K=-1$$

$$K=-\frac{1}{3}$$

[(D) (CX+) = 5e

Soive:

$$\frac{\partial u}{\partial x} - \frac{\partial u}{\partial t} = 3u \cdot - \boxed{0}$$

8000

$$u(x,t): \times (x). T(t) - 3$$

$$\frac{\partial^{2}}{\partial x} : \times^{r} T$$

$$\frac{\partial^{2}}{\partial x} : \times T$$

÷ 3×7

$$\frac{\chi'}{3\chi} = \frac{1+\frac{7}{37}}{37} = K$$

37+ T' = K => T-37K+37 =0

=) ナーチオレリードコ = の

Soire F

A.E m-3K=0

: x(x) = A 3kx

m +3(1-K)== m= -3C1-K)

When C2 AB

$$m = -3C(1-K)$$
 $-3C(1-K)$ 
 $+) = Be$ 

TCE): Be

$$C(x,t) = AQ \cdot BQ$$

$$C(x,t) = AQ \cdot BQ$$

$$C(x,t) = 3[kx - (1-k)t]$$

$$= CQ \cdot BQ$$

$$S_{0(0)}$$
:  $C_{0}$   $K_{0}$  +  $S_{0(k-1)}$  +

 $\frac{x'}{7} + \frac{T'}{7} = 2$   $\frac{x'}{x} = 2 - \frac{T'}{7} = x$